

WHAT IS CLAIMED IS:

1. A current driver circuit for driving a pair of transmission lines by allowing a current to flow in a terminal resistor connected between the pair of transmission lines, the current driver circuit comprising:

5 a current driver having a current source transistor connected to a power source potential level, the current driver being coupled to the pair of transmission lines; and

 a current compensation circuit for compensation of an output current from the current driver in response to a common mode potential of the pair of transmission lines, the current compensation circuit being coupled to an output side of the current source
10 transistor.

2. The current driver circuit of claim 1, wherein the current compensation circuit initiates the compensation of the output current when a difference between the power source potential level connected to the current source transistor and the common mode potential becomes smaller than a specified value.

15 3. The current driver circuit of claim 1, wherein the current compensation circuit increases the output current by a reduction in the output current when the current source transistor enters a non-saturated region.

 4. The current driver circuit of claim 1, wherein the current compensation circuit comprises:

20 a plurality of resistors connected in series between the power source potential level and a ground level;

 a comparator for making a comparison between a terminal potential of each of the plurality of resistors and the common mode potential;

 a load transistor activated by a reversal of a magnitude relationship between the
25 common mode potential inputted to the comparator and the terminal potential; and

a Miller transistor for supplying, to the current driver, a current directly proportional to a current flowing in the load transistor.

5 5. The current driver circuit of claim 4, wherein the current compensation circuit further comprises a transistor provided between the power source potential level and the ground level and connected in series to the plurality of resistors.

6. The current driver circuit of claim 4, wherein

the comparator comprises a first nMOS transistor having a gate to which the common mode potential is inputted, a second nMOS transistor having a gate to which the terminal potential is inputted, and a first current source having one end connected to each
10 of the first and second nMOS transistors,

the load transistor is composed of a pMOS transistor connected in parallel to a second current source and having one end connected to the first nMOS transistor, and

the current supplied from the Miller transistor to the current driver is given by:

$$\{\beta \times (V_{gs} - V_t)^2 - I\} \times \alpha$$

15 (where V_{gs} is a potential difference between a source and the gate of the first nMOS transistor, V_t is a threshold voltage of the first nMOS transistor, β is a constant determined by a channel width and a channel length of the first nMOS transistor, I is a current flowing in the second current source, and α is a Miller ratio of a drain current of the Miller transistor to a drain current of the load transistor).

20 7. The current driver circuit of claim 1, further comprising a switch for disconnecting the current compensation circuit from the current driver.

8. A current driver circuit for driving a pair of transmission lines by allowing a current to flow in a terminal resistor connected between the pair of transmission lines, the current driver circuit comprising:

25 a current driver having a plurality of switch circuits for controlling a current

flowing in the pair of transmission lines; and

a current compensation circuit for controlling stepwise respective operations of the plurality of switch circuits in response to a variation in a common mode potential of the pair of transmission lines.

5 9. The current driver circuit of claim 8, wherein the current compensation circuit operates stepwise the plurality of switch circuits as a difference between a power source potential level and the common mode potential is reduced.

10 10. The current driver circuit of claim 8, wherein the current compensation circuit operates stepwise the plurality of switch circuits such that a total transistor size of the activated ones of switch elements composing the plurality of switch circuits varies non-linearly relative to a difference between the common mode potential and a power source potential level.

15 11. The current driver circuit of claim 8, wherein the specified one of the plurality of switch circuits comprises a resistor connected in series between a switch element composing the specified switch circuit and one of the pair of transmission lines.

12. The current driver circuit of claim 8, wherein each of switch elements composing the plurality of switch circuits is composed of a MOS transistor and the MOS transistor has a gate connected to a ground level via a given resistor.

20 13. The current driver circuit of claim 8, wherein each of the switch elements composing the plurality of switch circuits is composed of a miniaturized MOS transistor.